LINKVIT as part of the GIS&T education and training landscape in Europe

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The geospatial industry is a rapidly growing industry and involves high value/high tech jobs, innovative services and fast evolving technologies. Handling and using geospatial data and information requires specific skills, and the demand for well-trained GI professionals is high. Employers in the domain of GI find it very difficult to find well-trained and skilled employees. A recurrent complaint among companies and organization in the domain of GI is that the current supply of geospatial professionals is inadequate and the geospatial workers appear to be inadequately prepared to answer to the challenges and opportunities of this field. Hence, there is a clear need to make the geospatial workforce training system more demand-driven.
In order to set-up more demand-driven workforce education and training programs, there needs to be consensus about what geospatial professionals in Europe should know (knowledge requirements) and be able to do (skill requirements). For the identification of the specific knowledge areas that a professional needs to master for proficiency and success in its field or profession, a complete and consistently updated knowledge base is needed. Therefore, many sectors have already developed or are currently developing their domain-specific 'Body of Knowledge', as a reference framework containing the core knowledge of a profession.
In 2006, the University Consortium for Geographic Information Science (UCGIS) developed a Geographic Information Science and Technology Body of Knowledge (GI S&T BoK). The GIS&T BoK includes ten knowledge areas, 73 units (26 of which are designated as "core" units), 329 topics, and over 1,600 formal educational objectives. The GI S&T BoK was designed for use by curriculum planners and evaluators, certification and accreditation bodies, current and prospective students, human resources personnel, and geospatial professionals in government, industry, and academia. While the GI S&T BoK has been an important driver to improve education and training in the geospatial domain and make it more relevant to employers, in Europe the influence of this driver is still limited.

GI-N2K

The European project GI-N2K ('Geographic information : Need to Know') aims to make the geospatial education and training system in Europe more demand-driven and flexible by developing an up-to-date dynamic Geographic Information Science & Technology Body of Knowledge (GIS1T BoK Body) which takes into account the European dimension and the latest technological developments. The GI-N2K project is built around a network of 31 academic and non-academic partners from 25 countries, and is funded under the Lifelong Learning program Erasmus Multilateral Networks. Key activities of the project are the revision of the content of the GIS&T BoK to bring it in line with technological developments, emerging new knowledge areas and European context and the development of toolsets that allow to update, manage and use the GIS&T BoK.
In preparation of both activities, a study was undertaken of the current demand for and the supply of education and training in the domain of GIS&T. As part of this study, two surveys have been conducted, one on main knowledge and competences required by employers (the demand side) and one on the knowledge and competences that are central in the current offer of GIS&T education and training in Europe (the supply side).
The results of both surveys tell us more about the (mis)match between the demand for and the supply of geospatial education and training in Europe.
Based on the results of the survey on the supply of geospatial education and training, 427 existing courses in the domain of GIS&T in Europe have been identified. The majority of the courses are provided at bachelor or master level, but also several vocational training courses were identified. With regard to the content of the courses, the Knowledge Areas 'Analytical Methods', 'Geospatial Data' and 'Cartography and Visualization' were most often indicated as the subject of the courses. Knowledge areas that are the least well covered by existing education and training courses are the Organizational and Institutional Aspects (OI), Conceptual Foundations (CF) and Data Manipulation (DN). The knowledge area that is the most well covered by vocational training courses is the area of 'Cartography and Visualization'.

The demand for geospatial skills and knowledge

To assess the workforce demand in GIS&T, professionals active in the GIS&T domain in Europe were asked to evaluate the relevance of the difference knowledge areas in their professional work. It was interesting to see how the three main sectors – public administration, private organisations and academia – evaluated the BoK Knowledge Areas congruently. 'Geospatial data' and 'Cartography and Visualization' were considered as the most relevant BoK knowledge areas, whereas advanced 'geocomputation' received the lowest rating.
In addition to the evaluation of the relevance of existing knowledge areas, respondents were also asked which topics and competences they expected to gain important in the next five years. About one third of the keywords mentioned by the respondents are absent in the GIS&T BoK. One of the four key topics that are expected to gain importance although not or only partly covered in the current BoK is SDI. Some important skills and areas of knowledge mentioned by the respondents are geoportals, data harmonization and INSPIRE. The three other hot topics are programming, WebGIS and data acquisition. The topic of data acquisition also includes several skills and areas of knowledge directly or indirectly related to SDI and INSPIRE, such as open data, crowd sourcing and VGI and sensor web.

LINKVIT

It is interesting to see how the LINKVIT training programme covers several of the knowledge areas and topics that are expected to become more important in the future. Topics such as SDI, INSPIRE, geoportals, data harmonization and open data are thoroughly addressed in one or more of the LINKVIT modules. It should also be noticed that the LINKVIT training programme covers the Organizational and Institutional Aspects of geospatial data, an area that is not covered in most of the existing education and training courses. Both observations illustrate the importance of the LINKVIT training programme and the unique position of the programme in the European GIS&T education and training landscape. The knowledge areas, units and topics that are included in the GIS&T BoK will be useful for identifying and presenting the content of each of the LINKVIT modules and of the LINKVIT programme in general. Conversely, the knowledge that is generated by the LINKVIT project will be valuable input for the revision of the GIS&T BoK.
Within the LINKVIT project, effort is undertaken to maximize the usability and effectiveness of the training modules. An important characteristic of the LINKVIT project is that all training modules are open to the public and are developed in such a way that they can be adapted to a specific context with little additional effort. While most of the material is originally developed for vocational training, also the relevance and usability of the LINKVIT training material for higher education courses is explored in the context of the project. The results of this exploration will be of great value for the valorization of the LINKVIT deliverables by the academic community.

GI-N2K workshop in Lisbon (March 2015): academic and other partners of the Erasmus network discussing the revision of the GIS&T Body of Knowledge